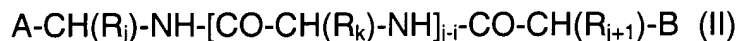


**AMENDMENTS TO THE CLAIMS:**

Amend the claims as follows:

Claim 1. (Canceled)

2. (Currently Amended) A vaccine comprising an immunoretroid form of an immunologically active peptide, said immunoretroid being a derivative of said peptide which binds to an antibody or an antibody fragment to said peptide with at least an equal affinity as said peptide; wherein said immunoretroid form is a retro-inverso peptide or a retro-peptide of a peptide, wherein said immunoretroid form of said peptide has the following formula II:



wherein

~~n, which is the number of aminoacyl residues in formula I, is 20a whole number from 3-1,000, and  $R_i$ ,  $R_k$ , and  $R_{j+1}$  are side chains of the aminoacyl residues,~~

~~$i$ ,  $j$  and  $k$  are whole numbers~~

~~wherein  $1 \leq i \leq j < n$ , and~~

~~if  $i=j$ ,  $k=0$ ; and~~

~~if  $i < j$ ,  $i + 1 \leq k \leq j$ ;~~

~~such that,~~

~~where  $i = 1$  and  $j + 1 = n$ , A is Q and B is M;~~

~~where  $i = 1$  and  $j + 1 \neq n$ , A is Q and B is L;~~

~~where  $i \neq 1$  and  $j + 1 = n$ , A is T and B is M; and~~

where  $i \neq 1$  and  $j + 1 \neq n$ , A is T and B is L;

Q being selected from the group consisting of H-,  $H_2N$ -, P-HN-,  $RR'N$ -,  $H_2NCO$ -,  $RR'NCO$ -,  $RCO$ -;

M being selected from the group consisting of H-,  $-COOH$ ,  $-COOR$ ,  $-CONH_2$ ,  $-CONRR'$  and  $-NHCOR$ ;

L being  $-CO-NH-CH(R_{j+2})-CO-\dots-NH-CH(R_n)-CO-Y$

wherein Y is selected from the group consisting of  $-OH$ ,  $-OR$ ,  $-NH_2$ , and  $-NRR'$ ; and

T being  $X-HN-CH(R_1)-CO-\dots-NH-CH(R_{i-1})CO-NH-$

wherein X is selected from the group consisting of H-, P-, R- and  $RCO$ -;

wherein

R and R' are independently selected from the group consisting of hydrogen,  $C_{1-25}$  alkyl,  $C_{3-25}$  allyl,  $C_{6-25}$  aryl, benzyl, 2-phenyl-ethyl, methyl-fluorenyl, glycolamide and benzhydrylglycolamide; and

P is a protecting group; and

and wherein said immunoretroid form is a retro-inverso peptide or a retro-peptide of a peptide selected from the group consisting of

FP peptide of serotype A12 of foot-and-mouth disease virus,

FL peptide of serotype A12 of foot-and-mouth disease virus,

SL peptide of serotype A12 of foot-and-mouth disease virus,

said vaccine further comprising a physiologically acceptable vehicle.

Claims 3-5. (Canceled)

6. (Original) The vaccine of claim 2 wherein said immunoretroid form of said immunologically active peptide is bound to a liposome.

7. (Original) The vaccine of claim 2 further comprising an adjuvant.

Claims 8-14. (Canceled)

15. (Original) A vaccine of claim 2 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

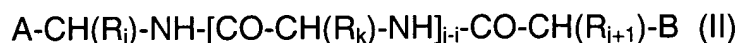
16. (Original) A vaccine of claim 2 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.

17. (Original) A vaccine of claim 7 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

18. (Original) A vaccine of claim 7 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.

Claims 19-25. (Canceled)

26. (new) A composition comprising an immunoretroid form of a peptide selected from the group consisting of FP peptide of serotype A12 of foot-and-mouth disease virus, FL peptide of serotype A12 of foot-and-mouth disease virus, and SL peptide of serotype A12 of foot-and-mouth disease virus, said immunoretroid being a derivative of said peptide which binds to an antibody or an antibody fragment to said peptide with at least an equal affinity as said peptide; wherein said immunoretroid form is a retro-inverso peptide or a retro-peptide of a peptide, wherein said immunoretroid form of said peptide has the following formula II:



wherein

n, which is the number of aminoacyl residues in formula II, is 20, and  $R_i$ ,  $R_k$ , and  $R_{j+1}$  are side chains of the aminoacyl residues,

i, j and k are whole numbers

wherein  $1 \leq i \leq j < n$ , and

if  $i=j$ ,  $k=0$ ; and

if  $i < j$ ,  $i + 1 \leq k \leq j$ ;

such that,

where  $i = 1$  and  $j + 1 = n$ , A is Q and B is M;

where  $i = 1$  and  $j + 1 \neq n$ , A is Q and B is L;

where  $i \neq 1$  and  $j + 1 = n$ , A is T and B is M; and

where  $i \neq 1$  and  $j + 1 \neq n$ , A is T and B is L;

Q being selected from the group consisting of H-,  $H_2N$ -, P-HN-,  $RR'N$ -,  $H_2NCO$ -,  $RR'NCO$ -,  $RCO$ -;

M being selected from the group consisting of H-, -COOH, -COOR, -CONH<sub>2</sub>, -CONRR' and -NHCOR;

L being -CO-NH-CH(R<sub>j+2</sub>)-CO-...-NH-CH(R<sub>n</sub>)-CO-Y  
wherein Y is selected from the group consisting of -OH, -OR, -NH<sub>2</sub>, and -NRR'; and

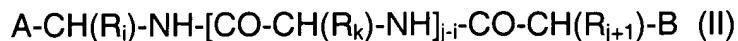
T being X-HN-CH(R<sub>1</sub>)-CO-...-NH-CH(R<sub>i-1</sub>)-CO-NH-  
wherein X is selected from the group consisting of H-, P-, R- and RCO-;  
wherein

R and R' are independently selected from the group consisting of hydrogen, C<sub>1-25</sub> alkyl, C<sub>3-25</sub> allyl, C<sub>6-25</sub> aryl, benzyl, 2-phenyl-ethyl, methyl-fluorenyl, glycolamide and benzhydrylglycolamide; and

P is a protecting group;

said composition further comprising a diluent.

27. (new) A composition comprising an immunoretroid form of a peptide selected from the group consisting of FP peptide of serotype A12 of foot-and-mouth disease virus, FL peptide of serotype A12 of foot-and-mouth disease virus, and SL peptide of serotype A12 of foot-and-mouth disease virus, said immunoretroid being a derivative of said peptide which binds to an antibody or an antibody fragment to said peptide with at least an equal affinity as said peptide; wherein said immunoretroid form is a retro-inverso peptide or a retro-peptide of a peptide, wherein said immunoretroid form of said peptide has the following formula II:



wherein

n is 20,

i is a whole number in the range of 1-19,

j is a whole number in the range of 1-19,

k is 0 or whole number in the range of 2-19,

and  $R_i$ ,  $R_k$ , and  $R_{j+1}$  are side chains of the aminoacyl residues of said SEQ ID

NO:7, SEQ ID NO:8 or SEQ ID NO:9,

wherein  $1 \leq i \leq j < n$ , and

if  $i=j$ ,  $k=0$ ; and

if  $i < j$ ,  $i + 1 \leq k \leq j$ ;

such that,

where  $i = 1$  and  $j + 1 = n$ , A is Q and B is M;

where  $i = 1$  and  $j + 1 \neq n$ , A is Q and B is L;

where  $i \neq 1$  and  $j + 1 = n$ , A is T and B is M; and

where  $i \neq 1$  and  $j + 1 \neq n$ , A is T and B is L;

Q being selected from the group consisting of H-,  $H_2N$ -, P-HN-,  $RR'N$ -,  $H_2NCO$ -,  $RR'NCO$ -,  $RCO$ -;

M being selected from the group consisting of H-, -COOH, -COOR, -CONH<sub>2</sub>, -CONRR' and -NHCOR;

L being  $-CO-NH-CH(R_{j+2})-CO-\dots-NH-CH(R_n)-CO-Y$

wherein Y is selected from the group consisting of -OH, -OR, -NH<sub>2</sub>, and -NRR'; and

T being  $X-HN-CH(R_1)-CO-\dots-NH-CH(R_{i-1})CO-NH-$

wherein X is selected from the group consisting of H-, P-, R- and  $RCO$ -;

wherein

R<sub>1</sub> is CH<sub>2</sub>SH, R<sub>2</sub> is H, R<sub>3</sub> is CH<sub>2</sub>OH, R<sub>4</sub> is H, R<sub>5</sub> is CH(CH<sub>3</sub>)<sub>2</sub>, R<sub>6</sub> is (CH<sub>2</sub>)<sub>3</sub>NHC(NH)NH<sub>2</sub>, R<sub>7</sub> is H, R<sub>8</sub> is CH<sub>2</sub>COOH, R<sub>9</sub> is CH<sub>2</sub>(C<sub>6</sub>H<sub>5</sub>) or CH<sub>2</sub>OH, R<sub>10</sub> is H, R<sub>11</sub> is CH<sub>2</sub>OH, R<sub>12</sub> is CH<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, R<sub>13</sub> is CH<sub>3</sub>, R<sub>14</sub> is C<sub>3</sub>H<sub>6</sub> or CH<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>, R<sub>15</sub> is (CH<sub>2</sub>)<sub>3</sub>NHC(NH)NH<sub>2</sub>, R<sub>16</sub> is CH(CH<sub>3</sub>)<sub>2</sub>, R<sub>17</sub> is CH<sub>3</sub>, R<sub>18</sub> is (CH<sub>2</sub>)<sub>3</sub>NHC(NH)NH<sub>2</sub>, R<sub>19</sub> is CH<sub>2</sub>CH<sub>2</sub>C(O)NH<sub>2</sub> and R<sub>20</sub> is CH<sub>2</sub>CH(CH<sub>3</sub>)<sub>2</sub>,

R and R' are independently selected from the group consisting of hydrogen, C<sub>1-25</sub> alkyl, C<sub>3-25</sub> allyl, C<sub>6-25</sub> aryl, benzyl, 2-phenyl-ethyl, methyl-fluorenyl, glycolamide and benzhydrylglycolamide;

P is a protecting group;

said composition further comprising a diluent.

28. (new) The composition of claim 26 or claim 27 wherein said immunoretroid form of said immunologically active peptide is bound to a liposome.

29. (new) The composition of claim 26 or claim 27 further comprising an adjuvant.

30. (new) The composition of claim 26 or claim 27 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

31. (new) A composition of claim 26 or claim 27 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.

32. (new) The composition of claim 29 wherein R and R' are independently selected from the group consisting of methyl, ethyl, isopropyl, tert-butyl and phenyl.

33. (new) The composition of claim 29 wherein P is selected from the group consisting of tert-butyloxycarbonyl, fluorenylmethyloxycarbonyl, benzyloxycarbonyl, and allyloxycarbonyl.